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SEQUENCE LISTING

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O'Connell, Peter

<120> Methods and Composition in Breast Cancer Diagnosis and
Therapeutics

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<140> US 10/052,092

<141> 2002-01-18

<150> US 60/262,990

<151> 2001-01-19

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 <213> Artificial Sequence

 <220>
 <223> Estrogen Response Element

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<400> 8
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7

<210> 9
 <211> 595
 <212> PRT
 <213> Human

<400> 9

Met Thr Met Thr Leu His Thr Lys Ala Ser Gly Met Ala Leu Leu His
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Gln Ile Gln Gly Asn Glu Leu Glu Pro Leu Asn Arg Pro Gln Leu Lys

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Ile	Pro	Leu	Glu	Arg	Pro	Leu	Gly	Glu	Val	Tyr	Leu	Asp	Ser	Ser	Lys
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Pro	Ala	Val	Tyr	Asn	Tyr	Pro	Glu	Gly	Ala	Ala	Tyr	Glu	Phe	Asn	Ala
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Ala	Ala	Ala	Ala	Asn	Ala	Gln	Val	Tyr	Gly	Gln	Thr	Gly	Leu	Pro	Tyr
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Gly	Pro	Gly	Ser	Glu	Ala	Ala	Ala	Phe	Gly	Ser	Asn	Gly	Leu	Gly	Gly
			85					90						95	
Phe	Pro	Pro	Leu	Asn	Ser	Val	Ser	Pro	Ser	Pro	Leu	Met	Leu	Leu	His
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Glu	Ser	Ala	Lys	Glu	Thr	Arg	Tyr	Cys	Ala	Val	Cys	Asn	Asp	Tyr	Ala
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Ser	Gly	Tyr	His	Tyr	Gly	Val	Trp	Ser	Cys	Glu	Gly	Cys	Lys	Ala	Phe
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			245						250					255	
Lys	Asp	Arg	Arg	Gly	Gly	Arg	Met	Leu	Lys	His	Lys	Arg	Gln	Arg	Asp
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Asp Gly Glu Gly Arg Gly Glu Val Gly Ser Ala Gly Asp Met Arg Ala
 275 280 285

Ala Asn Leu Trp Pro Ser Pro Leu Met Ile Lys Arg Ser Lys Lys Asn
 290 295 300

Ser Leu Ala Leu Ser Leu Thr Ala Asp Gln Met Val Ser Ala Leu Leu
 305 310 315 320

Asp Ala Glu Pro Pro Ile Leu Tyr Ser Glu Tyr Asp Pro Thr Arg Pro
 325 330 335

Phe Ser Glu Ala Ser Met Met Gly Leu Leu Thr Asn Leu Ala Asp Arg
 340 345 350

Glu Leu Val His Met Ile Asn Trp Ala Lys Arg Val Pro Gly Phe Val
 355 360 365

Asp Leu Thr Leu His Asp Gln Val His Leu Leu Glu Cys Ala Trp Leu
 370 375 380

Glu Ile Leu Met Ile Gly Leu Val Trp Arg Ser Met Glu His Pro Val
 385 390 395 400

Lys Leu Leu Phe Ala Pro Asn Leu Leu Leu Asp Arg Asn Gln Gly Lys
 405 410 415

Cys Val Glu Gly Met Val Glu Ile Phe Asp Met Leu Leu Ala Thr Ser
 420 425 430

Ser Arg Phe Arg Met Met Asn Leu Gln Gly Glu Glu Phe Val Cys Leu
 435 440 445

Lys Ser Ile Ile Leu Leu Asn Ser Gly Val Tyr Thr Phe Leu Ser Ser
 450 455 460

Thr Leu Lys Ser Leu Glu Glu Lys Asp His Ile His Arg Val Leu Asp
 465 470 475 480

Lys Ile Thr Asp Thr Leu Ile His Leu Met Ala Lys Ala Gly Leu Thr
 485 490 495

Leu Gln Gln Gln His Gln Arg Leu Ala Gln Leu Leu Leu Ile Leu Ser
 500 505 510

His Ile Arg His Met Ser Asn Lys Gly Met Glu His Leu Tyr Ser Met
515 520 525

Lys Cys Lys Asn Val Val Pro Leu Tyr Asp Leu Leu Leu Glu Met Leu
530 535 540

Asp Ala His Arg Leu His Ala Pro Thr Ser Arg Gly Gly Ala Ser Val
545 550 555 560

Glu Glu Thr Asp Gln Ser His Leu Ala Thr Ala Gly Ser Thr Ser Ser
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His Ser Leu Gln Lys Tyr Tyr Ile Thr Gly Glu Ala Glu Gly Phe Pro
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Ala Thr Val
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<210> 10

<211> 547

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic Estrogen Receptor Ligand Binding Domain Fusion

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Glu Gly Glu Gly Asp Ala Thr Tyr Gly Lys Leu Thr Leu Lys Phe Ile
35 40 45

Cys Thr Thr Gly Lys Leu Pro Val Pro Trp Pro Thr Leu Val Thr Thr
50 55 60

Leu Thr Trp Gly Val Gln Cys Phe Ser Arg Tyr Pro Asp His Met Lys
65 70 75 80

Gln His Asp Phe Phe Lys Ser Ala Met Pro Glu Gly Tyr Val Gln Glu
85 90 95

Arg Thr Ile Phe Phe Lys Asp Asp Gly Asn Tyr Lys Thr Arg Ala Glu
100 105 110

Val Lys Phe Glu Gly Asp Thr Leu Val Asn Arg Ile Glu Leu Lys Gly
 115 120 125

Ile Asp Phe Lys Glu Asp Gly Asn Ile Leu Gly His Lys Leu Glu Tyr
 130 135 140

Asn Tyr Ile Ser His Asn Val Tyr Ile Thr Ala Asp Lys Gln Lys Asn
 145 150 155 160

Gly Ile Lys Ala His Phe Lys Ile Arg His Asn Ile Glu Asp Gly Ser
 165 170 175

Val Gln Leu Ala Asp His Tyr Gln Gln Asn Thr Pro Ile Gly Asp Gly
 180 185 190

Pro Val Leu Leu Pro Asp Asn His Tyr Leu Ser Thr Gln Ser Ala Leu
 195 200 205

Ser Lys Asp Pro Asn Glu Lys Arg Asp His Met Val Leu Leu Glu Phe
 210 215 220

Val Thr Ala Ala Arg Met Pro Gly Gly Ser Ala Gly Asp Met Arg Ala
 225 230 235 240

Ala Asn Leu Trp Pro Ser Pro Leu Met Ile Lys Arg Ser Lys Lys Asn
 245 250 255

Ser Leu Ala Leu Ser Leu Thr Ala Asp Gln Met Val Ser Ala Leu Leu
 260 265 270

Asp Ala Glu Pro Pro Ile Leu Tyr Ser Glu Tyr Asp Pro Thr Arg Pro
 275 280 285

Phe Ser Glu Ala Ser Met Met Gly Leu Leu Thr Asn Leu Ala Asp Arg
 290 295 300

Glu Leu Val His Met Ile Asn Trp Ala Lys Arg Val Pro Gly Phe Val
 305 310 315 320

Asp Leu Thr Leu His Asp Gln Val His Leu Leu Glu Cys Ala Trp Leu
 325 330 335

Glu Ile Leu Met Ile Gly Leu Val Trp Arg Ser Met Glu His Pro Val
 340 345 350

Lys Leu Leu Phe Ala Pro Asn Leu Leu Leu Asp Arg Asn Gln Gly Lys
355 360 365

Cys Val Glu Gly Met Val Glu Ile Phe Asp Met Leu Leu Ala Thr Ser
370 375 380

Ser Arg Phe Arg Met Met Asn Leu Gln Gly Glu Glu Phe Val Cys Leu
385 390 395 400

Lys Ser Ile Ile Leu Leu Asn Ser Gly Val Tyr Thr Phe Leu Ser Ser
405 410 415

Thr Leu Lys Ser Leu Glu Glu Lys Asp His Ile His Arg Val Leu Asp
420 425 430

Lys Ile Thr Asp Thr Leu Ile His Leu Met Ala Lys Ala Gly Leu Thr
435 440 445

Leu Gln Gln Gln His Gln Arg Leu Ala Gln Leu Leu Leu Ile Leu Ser
450 455 460

His Ile Arg His Met Ser Asn Lys Gly Met Glu His Leu Tyr Ser Met
465 470 475 480

Lys Cys Lys Asn Val Val Pro Leu Tyr Asp Leu Leu Leu Glu Met Leu
485 490 495

Asp Ala His Arg Leu His Ala Pro Thr Ser Arg Gly Gly Ala Ser Val
500 505 510

Glu Glu Thr Asp Gln Ser His Leu Ala Thr Ala Gly Ser Thr Ser Ser
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His Ser Leu Gln Lys Tyr Tyr Ile Thr Gly Glu Ala Glu Gly Phe Pro
530 535 540

Ala Thr Val
545

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<211> 113
<212> PRT
<213> human

<400> 11

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 35 40 45
 Ala Leu Ser Leu Thr Ala Asp Gln Met Val Ser Ala Leu Leu Asp Ala
 50 55 60
 Glu Pro Pro Ile Leu Tyr Ser Glu Tyr Asp Pro Thr Arg Pro Phe Ser
 65 70 75 80
 Glu Ala Ser Met Met Gly Leu Leu Thr Asn Leu Ala Asp Arg Glu Leu
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Val

<210> 12
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<400> 12

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 35 40 45
 Pro Ala Val Tyr Asn Tyr Pro Glu Gly Ala Ala Tyr Glu Phe Asn Ala
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 Ala Ala Ala Ala Asn Ala Gln Val Tyr Gly Gln Thr Gly Leu Pro Tyr
 65 70 75 80
 Gly Pro Gly Ser Glu Ala Ala Ala Phe Gly Ser Asn Gly Leu Gly Gly
 85 90 95

Phe Pro Pro Leu Asn Ser Val Ser Pro Ser Pro Leu Met Leu Leu His
 100 105 110

Pro Pro Pro Gln Leu Ser Pro Phe Leu Gln Pro His Gly Gln Gln Val
 115 120 125

Pro Tyr Tyr Leu Glu Asn Glu Pro Ser Gly Tyr Thr Val Arg Glu Ala
 130 135 140

Gly Pro Pro Ala Phe Tyr Arg Pro Asn Ser Asp Asn Arg Arg Gln Gly
 145 150 155 160

Gly Arg Glu Arg Leu Ala Ser Thr Asn Asp Lys Gly Ser Met Ala Met
 165 170 175

Glu Ser Ala Lys Glu Thr Arg Tyr Cys Ala Val Cys Asn Asp Tyr Ala
 180 185 190

Ser Gly Tyr His Tyr Gly Val Trp Ser Cys Glu Gly Cys Lys Ala Phe
 195 200 205

Phe Lys Arg Ser Ile Gln Gly His Asn Asp Tyr Met Cys Pro Ala Thr
 210 215 220

Asn Gln Cys Thr Ile Asp Lys Asn Arg Arg Lys Ser Cys Gln Ala Cys
 225 230 235 240

Arg Leu Arg Lys Cys Tyr Glu Val Gly Met Met Lys Gly Gly Ile Arg
 245 250 255

Lys Asp Arg Arg Gly Gly Arg Met Leu Lys His Lys Arg Gln Arg Asp
 260 265 270

Asp Gly Glu Gly Arg Gly Glu Val Gly Ser Ala Gly Asp Met Arg Ala
 275 280 285

Ala Asn Leu Trp Pro Ser Pro Leu Met Ile Lys Arg Ser Lys Lys Asn
 290 295 300

Ser Leu Ala Leu Ser Leu Thr Ala Asp Gln Met Val Ser Ala Leu Leu
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Asp Ala Glu Pro Pro Ile Leu Tyr Ser Glu Tyr Asp Pro Thr Arg Pro
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Phe Ser Glu Ala Ser Met Met Gly Leu Leu Thr Asn Leu Ala Asp Arg
 340 345 350

Glu Leu Val His Met Ile Asn Trp Ala Lys Arg Val Pro Gly Phe Val
 355 360 365

Asp Leu Thr Leu His Asp Gln Val His Leu Leu Glu Cys Ala Trp Leu
 370 375 380

Glu Ile Leu Met Ile Gly Leu Val Trp Arg Ser Met Glu His Pro Val
 385 390 395 400

Lys Leu Leu Phe Ala Pro Asn Leu Leu Leu Asp Arg Asn Gln Gly Lys
 405 410 415

Cys Val Glu Gly Met Val Glu Ile Phe Asp Met Leu Leu Ala Thr Ser
 420 425 430

Ser Arg Phe Arg Met Met Asn Leu Gln Gly Glu Glu Phe Val Cys Leu
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Lys Ser Ile Ile Leu Leu Asn Ser Gly Val Tyr Thr Phe Leu Ser Ser
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Thr Leu Lys Ser Leu Glu Glu Lys Asp His Ile His Arg Val Leu Asp
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Lys Ile Thr Asp Thr Leu Ile His Leu Met Ala Lys Ala Gly Leu Thr
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Leu Gln Gln Gln His Gln Arg Leu Ala Gln Leu Leu Leu Ile Leu Ser
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His Ile Arg His Met Arg Asn Gln Gly Lys Cys Val Glu Gly Met Val
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Glu Ile Phe Asp Met Leu Leu Ala Thr Ser Ser Arg Phe Arg Met Met
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Asn Leu Gln Gly Glu Glu Phe Val Cys Leu Lys Ser Ile Ile Leu Leu
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Asn Ser Gly Val Tyr Thr Phe Leu Ser Ser Thr Leu Lys Ser Leu Glu
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Glu Lys Asp His Ile His Arg Val Leu Asp Lys Ile Thr Asp Thr Leu

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585

590

Ile His Leu Met Ala Lys Ala Gly Leu Thr Leu Gln Gln Gln His Gln
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Arg Leu Ala Gln Leu Leu Leu Ile Leu Ser His Ile Arg His Met Ser
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Asn Lys Gly Met Glu His Leu Tyr Ser Met Lys Cys Lys Asn Val Val
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Pro Leu Tyr Asp Leu Leu Leu Glu Met Leu Asp Ala His Arg Leu His
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Ala Pro Thr Ser Arg Gly Gly Ala Ser Val Glu Glu Thr Asp Gln Ser
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Ala Ala Ala Ala Asn Ala Gln Val Tyr Gly Gln Thr Gly Leu Pro Tyr
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Gly Pro Gly Ser Glu Ala Ala Ala Phe Gly Ser Asn Gly Leu Gly Gly
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Phe Pro Pro Leu Asn Ser Val Ser Pro Ser Pro Leu Met Leu Leu His
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Pro Tyr Tyr Leu Glu Asn Glu Pro Ser Gly Tyr Thr Val Arg Glu Ala
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Gly Pro Pro Ala Phe Tyr Arg Pro Asn Ser Asp Asn Arg Arg Gln Gly
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Gly Arg Glu Arg Leu Ala Ser Thr Asn Asp Lys Gly Ser Met Ala Met
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Glu Ser Ala Lys Glu Thr Arg Tyr Cys Ala Val Cys Asn Asp Tyr Ala
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Ser Gly Tyr His Tyr Gly Val Trp Ser Cys Glu Gly Cys Lys Ala Phe
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Phe Lys Arg Ser Ile Gln Gly His Asn Asp Tyr Met Cys Pro Ala Thr
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Arg Leu Arg Lys Cys Tyr Glu Val Gly Met Met Lys Gly Gly Ile Arg
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Lys Asp Arg Arg Gly Gly Arg Met Leu Lys His Lys Arg Gln Arg Asp
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Asp Gly Glu Gly Arg Gly Glu Val Gly Ser Ala Gly Asp Met Arg Ala
275 280 285
Ala Asn Leu Trp Pro Ser Pro Leu Met Ile Lys Arg Ser Lys Lys Asn
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Ser Leu Ala Leu Ser Leu Thr Ala Asp Gln Met Val Ser Ala Leu Leu
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Asp Ala Glu Pro Pro Ile Leu Tyr Ser Glu Tyr Asp Pro Thr Arg Pro
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Phe Ser Glu Ala Ser Met Met Gly Leu Leu Thr Asn Leu Ala Asp Arg
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Glu Leu Val His Met Ile Asn Trp Ala Lys Arg Val Pro Gly Phe Val
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Asp Leu Thr Leu His Asp Gln Val His Leu Leu Glu Cys Ala Trp Leu
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Glu Ile Leu Met Ile Gly Leu Val Trp Arg Ser Met Glu His Pro Val
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Cys Val Glu Gly Met Val Glu Ile Phe Asp Met Leu Leu Ala Thr Ser
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Ser Arg Phe Arg Met Met Asn Leu Gln Gly Glu Glu Phe Val Cys Leu
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Lys Ser Ile Ile Leu Leu Asn Ser Gly Val Tyr Thr Phe Leu Ser Ser
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Thr Leu Lys Ser Leu Glu Glu Lys Asp His Ile His Arg Val Leu Asp
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Lys Ile Thr Asp Thr Leu Ile His Leu Met Ala Lys Ala Gly Leu Thr
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Leu Gln Gln Gln His Gln Arg Leu Ala Gln Leu Leu Leu Ile Leu Ser
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His Ile Arg His Met Ser Asn Lys Gly Met Glu His Leu Tyr Ser Met
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Lys Cys Lys Asn Val Val Pro Leu Tyr Asp Leu Leu Leu Glu Met Leu
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Asp Ala His Arg Leu His Ala Pro Thr Ser Arg Gly Gly Ala Ser Val
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Glu Glu Thr Asp Gln Ser His Leu Ala Thr Ala Gly Ser Thr Ser Ser
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Ala Thr Val
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Ala Ala Ala Ala Asn Ala Gln Val Tyr Gly Gln Thr Gly Leu Pro Tyr
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Gly Pro Gly Ser Glu Ala Ala Ala Phe Gly Ser Asn Gly Leu Gly Gly
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Phe Pro Pro Leu Asn Ser Val Ser Pro Ser Pro Leu Met Leu Leu His
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Pro Pro Pro Gln Leu Ser Pro Phe Leu Gln Pro His Gly Gln Gln Val
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Pro Tyr Tyr Leu Glu Asn Glu Pro Ser Gly Tyr Thr Val Arg Glu Ala
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Gly Pro Pro Ala Phe Tyr Arg Pro Asn Ser Asp Asn Arg Arg Gln Gly
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Gly Arg Glu Arg Leu Ala Ser Thr Asn Asp Lys Gly Ser Met Ala Met
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Glu Ser Ala Lys Glu Thr Arg Tyr Cys Ala Val Cys Asn Asp Tyr Ala
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Ser Gly Tyr His Tyr Gly Val Trp Ser Cys Glu Gly Cys Lys Ala Phe
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Phe Lys Arg Ser Ile Gln Gly His Asn Asp Tyr Met Cys Pro Ala Thr
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Asn Gln Cys Thr Ile Asp Lys Asn Arg Arg Lys Ser Cys Gln Ala Cys
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Phe Ser Glu Ala Ser Met Met Gly Leu Leu Thr Asn Leu Ala Asp Arg
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Glu Leu Val His Met Ile Asn Trp Ala Lys Arg Val Pro Gly Phe Val
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Asp Leu Thr Leu His Asp Gln Val His Leu Leu Glu Cys Ala Trp Leu
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Glu Ile Leu Met Ile Gly Leu Val Trp Arg Ser Met Glu His Pro Val
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Lys Leu Leu Phe Ala Pro Asn Leu Leu Leu Asp Arg Asn Gln Gly Lys
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Cys Val Glu Gly Met Val Glu Ile Phe Asp Met Leu Leu Ala Thr Ser
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Ser Arg Phe Arg Met Met Asn Leu Gln Gly Glu Glu Phe Val Cys Leu
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Lys Ser Ile Ile Leu Leu Asn Ser Gly Val Tyr Thr Phe Leu Ser Ser
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Thr Leu Lys Ser Leu Glu Glu Lys Asp His Ile His Arg Val Leu Asp
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Lys Ile Thr Asp Thr Leu Ile His Leu Met Ala Lys Ala Gly Leu Thr
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Leu Gln Gln Gln His Gln Arg Leu Ala Gln Leu Leu Leu Ile Leu Ser
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His Ile Arg His Met Ser Asn Lys Gly Met Glu His Leu Tyr Ser Met
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Lys Cys Lys Asn Val Val Pro Leu Tyr Asp Leu Leu Leu Glu Met Leu
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Asp Ala His Arg Leu His Ala Pro Thr Ser Arg Gly Gly Ala Ser Val
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Glu Glu Thr Asp Gln Ser His Leu Ala Thr Ala Gly Ser Thr Ser Ser
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Ala Thr Val
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<213> violet cress

<400> 29

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Ala Ala Lys Ile Ala Glu Leu Gly Phe Thr Ala Ser Thr Leu Val Gly
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Met Lys Asp Glu Glu Leu Glu Asp Met Met Asn Ser Leu Ser His Ile
65 70 75 80

Phe Arg Trp Glu Leu Leu Val Gly Glu Arg Tyr Gly Ile Lys Ala Ala
85 90 95

Val Arg Ala Glu Arg Arg Arg Leu Gln Glu Glu Glu Glu Asp Glu Ser
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Ser Arg Arg Arg His Leu Leu Leu Ser Ala Ala Gly Asp Ser Gly Thr
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His His Ala Leu Asp Ala Leu Ser Gln Glu Asp Asp Trp Thr Gly Leu
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Gly Phe Gly Gly Tyr Leu Glu Ser Ser Val His Gly Lys Met Lys Lys
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His Gln Pro Arg Arg Arg Lys Lys Pro Leu Val Leu Thr Ser Val Glu
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Thr Asp Asp Asp Gly Asn Asp Asn Glu Asp Asp Asp Gly Met Asp Asn
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Gly Asn Gly Gly Ile Gly Leu Gly Thr Glu Arg Gln Arg Glu His Pro
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Phe Ile Val Thr Glu Pro Gly Glu Val Ala Arg Gly Lys Lys Asn Gly

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 Val Thr Asn Gln Val Phe Arg Tyr Ala Lys Lys Ser Gly Ala Ser Tyr
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 Ile Asn Lys Pro Lys Met Arg His Tyr Val His Cys Tyr Ala Leu His
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 305 310 315 320
 Arg Gly Glu Asn Val Gly Ser Trp Arg Gln Ala Cys Tyr Lys Pro Leu
 325 330 335
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Pro Pro Pro Gln Leu Ser Pro Phe Leu His Pro His Gly Gln Gln Val
 115 120 125

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Gly Pro Pro Ala Phe Tyr Arg Ser Asn Ser Asp Asn Arg Arg Gln Ser
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Glu Ser Val Lys Glu Thr Arg Tyr Cys Ala Val Cys Asn Asp Tyr Ala
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Ser Gly Tyr His Tyr Gly Val Trp Ser Cys Glu Gly Cys Lys Ala Phe
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Phe Lys Arg Ser Ile Gln Gly His Asn Asp Tyr Met Cys Pro Ala Thr
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Asn Gln Cys Thr Ile Asp Lys Asn Arg Arg Lys Ser Cys Gln Ala Cys
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Arg Leu Arg Lys Cys Tyr Glu Val Gly Met Met Lys Gly Gly Ile Arg
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Lys Asp Arg Arg Gly Gly Arg Met Leu Lys His Lys Arg Gln Arg Asp
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Asp Leu Glu Gly Arg Asn Asp Met Gly Pro Ser Gly Asp Met Arg Ala
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Thr Asn Leu Trp Pro Ser Pro Leu Val Ile Lys His Thr Lys Lys Asn
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 325 330 335
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 Glu Leu Val His Met Ile Asn Trp Ala Lys Arg Val Pro Gly Phe Gly
 355 360 365
 Asp Leu Asn Leu His Asp Gln Val His Leu Leu Glu Cys Ala Trp Leu
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 Glu Ile Leu Met Ile Gly Leu Ile Trp Arg Ser Met Glu His Pro Gly
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 Cys Val Glu Gly Met Val Glu Ile Phe Asp Met Leu Leu Ala Thr Ser
 420 425 430
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 465 470 475 480
 Lys Ile Thr Asp Thr Leu Ile His Leu Met Ala Lys Ala Gly Leu Thr
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 225 230 235 240

Arg Leu Arg Lys Cys Tyr Glu Val Gly Met Met Lys Gly Gly Ile Arg
 245 250 255

Lys Asp Arg Arg Gly Gly Arg Met Leu Lys His Lys Arg Gln Arg Asp
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Asp Gly Glu Gly Arg Asn Glu Ala Val Pro Pro Gly Asp Met Arg Ser
 275 280 285

Ala Asn Leu Trp Pro Ser Pro Leu Leu Ile Lys His Thr Lys Lys Asn
 290 295 300

Ser Pro Val Leu Ser Leu Thr Ala Asp Gln Met Ile Ser Ala Leu Leu
 305 310 315 320

Glu Ala Glu Pro Pro Ile Ile Tyr Ser Glu Tyr Asp Pro Thr Arg Pro
 325 330 335

Leu Ser Glu Ala Ser Met Met Gly Leu Leu Thr Asn Leu Ala Asp Arg
 340 345 350

Glu Leu Val His Met Ile Asn Trp Ala Lys Arg Val Pro Gly Phe Leu
 355 360 365

Asp Leu Ser Leu His Asp Gln Val His Leu Leu Glu Cys Ala Trp Leu
 370 375 380

Glu Ile Leu Met Ile Gly Leu Val Trp Arg Ser Met Glu His Pro Gly
 385 390 395 400

Lys Leu Leu Phe Ala Pro Asn Leu Leu Leu Asp Arg Asn Gln Gly Lys
 405 410 415

Cys Val Glu Gly Met Val Glu Ile Phe Asp Met Leu Leu Ala Thr Ser
 420 425 430

Ser Arg Phe Arg Met Met Asn Leu Gln Gly Glu Glu Phe Val Cys Leu
 435 440 445

Lys Ser Ile Ile Leu Leu Asn Ser Gly Val Tyr Thr Phe Leu Ser Ser
 450 455 460

Thr Leu Lys Ser Leu Glu Glu Lys Asp His Ile His Arg Val Leu Asp
 465 470 475 480

Lys Ile Thr Asp Thr Leu Ile His Leu Met Ala Lys Ala Gly Leu Thr
 485 490 495

Leu Gln Gln Gln His Arg Arg Leu Ala Gln Leu Leu Leu Ile Leu Ser
 500 505 510

His Phe Arg His Met Ser Asn Lys Gly Met Glu His Leu Tyr Asn Met
 515 520 525

Lys Cys Lys Asn Val Val Pro Leu Tyr Asp Leu Leu Leu Glu Met Leu
 530 535 540

Asp Ala His Arg Leu His Ala Pro Thr Asn Leu Gly Gly Pro Pro Pro
 545 550 555 560

Glu Asp Met Ser Gln Ser Gln Leu Ala Thr Ser Gly Ser Thr Pro Ser
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His Ser Leu Gln Met Tyr Tyr Ile Thr Gly Glu Ala Glu Asn Phe Pro
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Thr Thr Ile
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Met Arg Thr Glu Phe Leu Met Gln Leu Asp Thr Val Leu Thr Ser Ala
20 25 30

Glu Asp Gln Ile Val Val Ile Cys Ala Thr Ser Lys Pro Glu Glu Ile
35 40 45

Asp Glu Ser Leu Arg Arg Tyr Phe Met Lys Arg Leu Leu Ile Pro Leu
50 55 60

Pro Asp Ser Thr Ala Arg His Gln Ile Ile Val Gln Leu Leu Ser Gln
65 70 75 80

His Asn Tyr Cys Leu Asn Asp Lys Glu Phe Ala Leu Leu Val Gln Arg
85 90 95

Thr Glu Gly Phe Ser Gly Leu Asp Val Ala His Leu Cys Gln Glu Ala
100 105 110

Val Val Gly Pro Leu His Ala Met Pro Ala Thr Asp Leu Ser Ala Ile
115 120 125

Met Pro Ser Gln Leu Arg Pro Val Thr Tyr Gln Asp Phe Glu Asn Ala
130 135 140

Phe Cys Lys Ile Gln Pro Ser Ile Ser Gln Lys Glu Leu Asp Met Tyr
145 150 155 160

Val Glu Trp Asn Lys Met Phe Gly Cys Ser Gln
165 170

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13